Mr. Michael T. Davis Pre-Calculus	2.1 Extensive Polynomial Factoring (1) November 10-11, 2015

Name: Solutions

Factoring Trinomials with $a \neq 1$

1. Factor $3x^2 - 11x - 4$ $= (3x + 1)(x - 4)$

2. Factor $5y^2 + 12y + 7$ $= (5y + 7)(y + 1)$

3. Factor $14t^2 + 11t - 15$ $= (2t + 3)(7t - 5)$

Factoring Binomials that are Difference of Squares

4. Factor $x^2 - 25$ $= (x - 5)(x + 5)$

5. Factor $m^2 - 36$ $= (m - 6)(m + 6)$

6. Factor $9k^2 - 49$ $= (3k - 7)(3k + 7)$

Factoring Trinomials that are Binomials Squared

7. Factor $x^2 + 4x + 4$ $= (x + 2)(x + 2) = (x + 2)^2$

8. Factor $n^2+8n+16$ $= (n+4)(n+4) = (n+4)^2$

9. Factor $p^2-20p+100$ $= (p-10)(p-10) = (p-10)^2$

10. Factor $4w^2+20w+25$ $= (2w+5)(2w+5) = (2w+5)^2$

Factoring Binomials that are a Difference of Cubes or a Sum of Cubes

11. Factor x^3-y^3 $= (x-y)(x^2+xy+y^2)$

12. Factor m^3-64 $= m^3-4^3 = (m-4)(m^2+4m+16)$

13. Factor $8k^3-27$ $= (2k)^3-3^3 = (2k-3)(4k^2+6k+9)$

14. Factor x^3+y^3 $= (x+y)(x^2-xy+y^2)$

15. Factor t^3+64 $= t^3+4^3 = (t+4)\cdot(t^2-4t+16)$

Factoring Binomials with a Common Factor

16. Factor $mx+3m$ $= m(x+3)$

17. Factor $2ry^2+50r$ $= 2r(y^2+25)$

18. Factor $8x^2-24x$ $= 8x(x-3)$

19. Factor $5m^3-45m$ $= 5m(m^2-9) = 5m(m-3)(m+3)$

Factoring Trinomials with a Common Factor

20. Factor $2x^2+10x+12$ $= 2(x^2+5x+6) = 2(x+2)(x+3)$

21. Factor $3y^3+6y^2-45y$ $= 3y(y^2+2y-15) = 3y(y+5)(y-3)$

22. Factor $4n^4-20n^3-56n^2$ $= 4n^2(n^2-5n-14) = 4n^2(n-7)(n+2)$

Factoring Higher Degree Polynomials by Grouping

23. Factor $x^3+5x^2+4x+20$ $= x^2(x+5)+4(x+5)$
$= (x+5)(x^2+4)$

24. Factor $y^3+2y^2-9y-18$ $= y^2(y+2)-9(y+2)$
$= (y+2)(y^2-9)$
$= (y+2)(y-3)(y+3)$

25. Factor $k^3-2k^2-16k+32$ $= k^2(k-2)-16(k-2)$
$= (k-2)(k^2-16)$
$= (k-2)(k-4)(k+4)$

Factoring Higher Degree Polynomials with a "Quadratic Form"

26. Factor x^4+6x^2+5 $= (x^2+1)(x^2+5)$

27. Factor p^4+6p^2-7 $= (p^2+7)(p^2-1) = (p^2+7)(p-1)(p+1)$

28. Factor z^4-13z^2+36 $= (z^2-4)(z^2-9) = (z-2)(z+2)(z-3)(z+3)$